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**Title :** Oxygen isotope composition of Bowhead Whale (*Balaena mysticetus*) baleen: A novel method to examine long-term migratory behavior

**Category :** Ecology

**Student :** Doctoral

**Preferred Format :** Poster Presentation

**Abstract :** Long-term studies of Bowhead Whale (*Balaena mysticetus*) migration patterns are logistically challenging. However, previous examinations of the stable isotopes of carbon ( $\delta^{13}\text{C}$ ) and nitrogen ( $\delta^{15}\text{N}$ ) along baleen plates illustrate the annual migration, as well as the related nutritional ecology of the western arctic population of *B. mysticetus*. Given the more negative  $\delta^{18}\text{O}$  values for freshwater sources (e.g. Mackenzie River =  $\sim -19\text{‰}$ ) versus the fairly constant  $\delta^{18}\text{O}$  values for ocean water (Standard Mean Ocean Water =  $\sim 0\text{‰}$ ), it is hypothesized that oxygen isotope analysis may further enhance studies of migratory behavior. To investigate this hypothesis, baleen from Alaskan *B. mysticetus* was sampled at 2 - 5cm intervals and analyzed for its stable oxygen isotope composition. Rather than a uniform stable isotopic composition, the  $\delta^{18}\text{O}$  values vary along the length of the baleen ( $\delta^{18}\text{O} = 8$  to  $18\text{‰}$ ) and appear to correspond to the whales' annual migration, with signatures indicative of their seasonally resident area. Lower  $\delta^{18}\text{O}$  values ( $\delta^{18}\text{O} < 12\text{‰}$ ) in the baleen are likely the result of whales consuming  $^{18}\text{O}$ -depleted material during summer feeding near points of freshwater discharge in the region (e.g. Mackenzie River). Oxygen isotope analysis promises to be an effective tool for ecological studies of baleen whales and may provide accurate resolution for tracking shifts in long-term migration patterns.